An Optimization Model for Waste Management in Demolition Works

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Abstract : Waste management has become a major issue in demolition works, because of its environmental impact (energy consumption, resource consumption, pollution...). However, improving waste management requires to take also into account the overall demolition process and to consider demolition main objectives (e.g. cost, delay). Establishing a strategy with these conflicting objectives (economic and environment) remains complex. In order to provide a decision-support for demolition companies, a multi-objective optimization model was developed. In this model, a demolition strategy is computed from a set of 80 decision variables (worker team composition, machines, treatment for each type of waste, choice of treatment platform...), which impacts the demolition objectives. The model has experimented on a real-case study (demolition of several buildings in France). To process the optimization, different optimization algorithms (NSGA2, MOPSO, DBEA...) were tested. Results allow the engineer in charge of this case, to build a sustainable demolition strategy without affecting cost or delay.
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